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Original Research Article

Hospital Based Retrospective Study to Investigate the Safety and Effectiveness of Open Simple Prostatectomy (OSP) in Octogenarians

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Abstract

Aim: The aim of the present study was to investigate the safety and effectiveness of open simple prostatectomy (OSP) in octogenarians.

Methods: The present study was conducted in the Department of Urology. Our retrospective review revealed that 200 patients underwent OSP during the study period. Patients were grouped based on their age: Group 1 included patients older than 50 and younger than 65, Group 2 consisted of patients between the ages of 65 and 80, while Group 3 included those aged ≥80 (i.e., octogenarians).

Results: In the present study, 32% were in ASA I and 20% had hypertension. Among these patients, 50 were in Group 1 (i.e., aged between 50 and 65), 100 in Group 2 (i.e., aged between 65 and 80), and 50 in Group 3 (i.e., age≥80). The rate of hypertension was significantly higher in Group 2 and Group 3 (i.e., octogenarians) than compared to Group 1. Although there was no difference between the groups regarding preoperative serum PSA levels, the rate of prostate biopsy rate was significantly higher in Group 1 and Group 2 than in compared to octogenarians. On the other hand, preoperative persistent AUR frequencies were significantly higher in octogenarians compared to others. Mean preoperative Qmax values were 5.57 ± 1.51, 6.84 ± 3.93 and 5.95 ± 2.04 ml/s in Group 1, Group 2 and Group 3, respectively. The mean PVR values were calculated as 136 ± 34, 137 ± 34, and 156 ± 29 in Group 1, Group 2, and Group 3, while the mean IPSS scores were 21.8 ± 4.37 in Group 1, 21.0 ± 6.41 in Group 2, and 22.5 ± 4.43 in Group 3. The complication of Hemorrhage requiring blood transfusion was managed by blood transfusion. Urethral stenosis was managed by Internal urethrotomy, Urethroplasty.

Conclusion: The present study concluded that OSP is a safe procedure, and its effectiveness is limited compared to the other groups in terms of urethral catheter duration, length of hospital stay and IPSS scores. Before OSP However, perioperative management should be individualized for each patient.

Keywords: Benign prostatic hyperplasia, Open simple prostatectomy, Octogenarians

Introduction

Open prostatectomy has been the operative treatment for benign prostatic enlargement for several decades until the advent of transurethral resection of the prostate TURP (the gold standard) [1] and other state-of-the act modalities like transurethral interstitial LASER ablation [2], thermotherapy [3] and needle ablation. [4] This led to the gradual reduction in open prostatectomy in the developed world. In the developing countries, however, skills in traditional open surgery are mandatory, because the patients present late with very large prostates. A gland that is too large and completely obscuring the trigone and the ureteric orifices will not be comfortably resected transurethrally. Most urologists are comfortable with removing glands in the range of 50–75 g, transurethrally open surgery is, therefore, recommended for larger glands. [5] Comorbid medical conditions and complications of BPH at presentation are also indications for open prostatectomy. [6]

Transurethral resection of the prostate (TURP) and open prostatectomy (OP) have been considered for decades the surgical standard for treating BPH.[7] Yet TURP and OP are associated with intraoperative and postoperative complications such as bleeding, clot retention requiring intervention, genitourinary infections, fluid absorption, and TUR syndrome. [7-10] Therefore, it is possible to deteriorate the quality of life after these procedures, especially in the elderly and comorbid patients. Elderly patients may be taking anticoagulants for cardiovascular disease and suffer from comorbidities such as hypertension, renal insufficiency or diabetes mellitus; they

therefore require procedures less invasive than TURP and OP. [11]

However, it is widely accepted that OSP can cause significant blood loss, require a blood transfusion and relatively long duration of hospital stay and recovery period. [12,13] Since elderly patients are vulnerable to postoperative adverse events, they should be given special attention during and after the OSP procedure. [14] Although it is known that the incidence of BPH increases with aging, the potential impact of aging on the efficacy and safety of OSP has not been widely investigated. [15,16] Since average life expectancy is increasing worldwide, the possibility of encountering an octogenarian patient affiicted by medical treatment-resistant LUTS with a high prostate volume is also increasing.

The aim of the present study was to investigate the safety and effectiveness of open simple prostatectomy (OSP) in octogenarians.

Materials and Methods

The present study was conducted in the Department of Urology, PMCH, Patna, Bihar, India for ten years. Our retrospective review revealed that 200 patients underwent OSP during the study period. Patient using anticoagulants and antiaggregants, patients who had a history of prostate or urethra surgeries, those who had an urodynamically-approved diagnosis of neurogenic voiding dysfunction, and those with prostate cancer were excluded. Patients with incomplete follow-up data were also omitted.

All patients underwent a general medical and standard urological evaluation preoperatively. The latter included a digital rectal examination (DRE), urinalysis, transrectal ultrasonography (TRUS) and prostate volume (PV) measurement, analysis of prostate-specific antigen (PSA), maximum flow rate (Qmax), post-voiding residual urine volume (PVR) and IPSS (International Prostate Symptom Score) assessments. The prostate volumes were measured by TRUS, and Qmax values were analyzed by uroflowmetry. Since we believed that the measurements performed immediately after voiding in the toilet would give more accurate results than the measurements performed after uroflowmetry, we preferred the former approach for PVR assessments. A portable bladder scanner was used in order to calculate the residual urine volume.

Recurrent acute urinary retention (AUR) or urinary tract infections, prostate-related macroscopic hematuria, medical treatment-resistant LUTS, renal functional deterioration due to BPH were considered indications of OSP in the presence of a PV higher than 80 ml.

All OSP procedures were performed using the transvesical (i.e., Freyer's) technique by specialists urologist. Continuous bladder irrigation was initiated immediately after insertion of a 22F 3-way Foley catheter following enucleation of the prostate and bleeding control. A non-suction drain was inserted before closure. The drain was removed once the daily discharge was less than 100 cc per day. Duration of surgery and estimated blood loss (EBL) were obtained from recorded in patient folders. Hemoglobin (Hgb) and hematocrit (Hct) drops were calculated as taking the difference between the pre-operative levels and postoperative lowest levels. The decision regarding blood transfusion was given based on EBL and Hgb or Hct drops. Patients who developed anemia symptoms or hemodynamic instability were given blood transfusions regardless of the laboratory parameters. EBL, Hgb and Hct levels. The Foley catheters were removed at post-operative fifth day once the urine output was clear, and patients were discharged after ensuring that the patient could void spontaneously. The complications were categorized based on Clavien-Dindo classification. Histopathological assessment reports of all patients were obtained from recorded in patient folders. The Qmax and PVR were measured during the first month, and the IPSS questionnaire was performed during the third-month outpatient clinic encounter.

Patients were grouped based on their age: Group 1 included patients older than 50 and younger than 65, Group 2 consisted of patients between the ages of 65 and 80, while Group 3 included those aged ≥80 (i.e., octogenarians). Study groups were compared regarding demographic and clinical preoperative features, duration of the procedure, EBL, the weight of the specimen, Hgb drop, Hct drop, blood transfusion rate, overall complication rate, Clavien-Dindo Class 3 or higher complication rate, duration of drain output, catheterization and hospital stay, postoperative Qmax, PVR and IPSS.

Statistical Analysis

Categorical variables were presented as numbers and percentages, while continuous variables were given as means and standard deviations. The normal distribution of the continuous variables was tested by the Kolmogorov-Smirnov Shapiro-Wilk test. Means of the multiple groups with normal and non-normal distributions were compared using Analysis of Variance (ANOVA) and Kruskal-Wallis tests. The Tukey HSD test was performed for post-hoc analysis when the ANOVA revealed a significant difference. The Tamhane's T2 test was used when the Kruskal-Wallis test gave significant results. The rates of categorical variables were compared using Pearson chi-square and Fisher's exact tests. The statistical analyses were performed by Statistical Package for Social Sciences (SPSS v21, IBM SPSS Statistics; IBM Corp., Armonk,

NY).

Results

Table 1: Demographic data and clinical characteristics

Number of patients	200
Mean age ± SD, (yrs)	67.3 ± 7.63
Mean BMI ± SD, (kg/m^2)	25.2 ± 3.67
ASA score, n(%) ASA 1	64 (32)
ASA 2	96 (48)
ASA 3	40 (20)
HT, n(%)	40 (20)
DM, n(%)	24 (12)
Mean PSA ± SD, (ng/ml)	8.32± 5.84
Mean TRUS PV ± SD, (cm^3)	141 ± 46
Median lob, n(%)	76 (38)
Preop prostate biopsy, n(%)	120 (60)
Bladder diverticulum, n(%)	10 (5)
Bladder stone, n(%)	64 (32)
Preop urethral catheter dependency, n(%)	84 (42)
History of AUR, n(%)	120 (60)
Mean preop Qmax ± SD, (ml/s)	6.414± 3.33
Mean preop PMRV ± SD, (ml)	145 ± 135
Mean preop IPSS ± SD	21.9 ± 5.74
Mean OT ± SD, (min)	120 ± 44
Mean EBL ± SD, (ml)	553 ± 334
Mean specimen weight ± SD, (g)	106 ± 58
Transfusion, n(%)	24 (12)
Overall complication, n(%)	48 (24)
Clavien ≥ 3 complication, n(%)	12 (6)
Mean catheterization time ± SD, (days)	5.67 ± 1.10
Mean LOS ± SD, (days)	5.67 ± 1.48
Mean postop Qmax ± SD, (ml/s)	22.3 ± 7.95
Mean postop PVR ± SD, (ml)	6.75 ± 2.38
Mean postop IPSS ± SD	18.8 ± 13.8

In the present study, 32% were in ASA I and 20% had hypertension.

Table 2: Comparison of preoperative patient characteristics between the age groups

Variables	**Group 1 (50-65)**	**Group 2 (65-79)**	**Group 3 (≥80 yrs)**	**P value**
Number of patients	50	**100**	**50**	
Mean BMI, (kg/m^2)	25.5 ± 3.47	26.4 ± 3.67	26.4 ± 4.16	0.212
Mean ASA score ± SD	1.58 ± 0.64	1.88 ± 0.62	2.08 ± 0.62	0.007
ASA 3 score, n(%)	4	24	12	0.003
HT, n(%)	4	26	10	0.004
DM, n(%)	3	11	10	
Mean PSA ± SD, (ng/ml)	8.81 ± 6.29	8.13 ± 6.22	8.33 ± 4.29	0.840
Mean TRUS PV ± SD, (cm^3)	125 ± 30	141 ± 43	152 ± 57	0.150
Median lob, n(%)	20	36	20	0.180
Preop prostate biopsy, n(%)	35	55	10	0.002

Bladder diverticulum, n(%)	2	6	2	<0.001
Bladder stone, n(%)	12	40	12	<0.001
Preop urethral catheter dependency	18	42	24	<0.001
History of AUR, n(%)	24	60	36	<0.001
Mean preop Qmax ± SD, (ml/s)	5.57 ± 1.51	6.84 ± 3.93	5.95 ± 2.04	0.660
Mean preop PVR ± SD, (ml)	136 ± 34	137 ± 34	156 ± 29	0.560
Mean IPSS ± SD	21.8 ± 4.37	21.0 ± 6.41	22.5 ± 4.43	0.612
Mean hemoglobin ± SD, (g/dl)	14.2 ± 1.05	14.3 ± 1.34	14.1 ± 1.48	0.352
Mean hematocrit ± SD, (%)	43.2 ± 2.82	43.1 ± 3.62	43.0 ± 3.88	0.942

Among these patients, 50 were in Group 1 (i.e., aged between 50 and 65), 100 in Group 2 (i.e., aged between 65 and 80), and 50 in Group 3 (i.e., age≥80). The rate of hypertension was significantly higher in Group 2 and Group 3 (i.e., octogenarians) than compared to Group 1. Although there was no difference between the groups regarding preoperative serum PSA levels, the rate of prostate biopsy rate was significantly higher in Group 1 and Group 2 than in compared to octogenarians. On the other hand, preoperative persistent AUR frequencies were significantly higher in octogenarians compared to others. Mean preoperative Qmax values were 5.57 ± 1.51, 6.84 ± 3.93 and 5.95 ± 2.04 ml/s in Group 1, Group 2 and Group 3, respectively. The mean PVR values were calculated as 136 ± 34, 137 ± 34, and 156 ± 29 in Group 1, Group 2, and Group 3, while the mean IPSS scores were 21.8 ± 4.37 in Group 1, 21.0 ± 6.41 in Group 2, and 22.5 ± 4.43 in Group 3.

Table 3: Comparison of transfusion rates and complication rates between age groups, summary of complications and complication management

Variables	Group 1 (50-65)	Group 2 (65-79)	Group 3 (≥80 yrs)	P value
Transfusion rate, n(%)	8	12	7	0.645
Overall complication, n(%)	11	24	14	0.820
Clavien ≥ 3 complication, n(%)	2	5	6	0.270
Complications	N	Classification according to CDCS	Management	
Fever	2	I	Antipyretics	
Transient elevation of serum creatinine	1	I	Hydration	
Urge incontinence	2	I	Antimuscarinic	
UTI	2	II	Antibiotics	
Hemorrhage requiring blood transfusion	15	II	Blood transfusion	
Organised haematoma in bladder	2	IIIb	Endoscopic intervention	
Bladder neck stenosis	2	IIIb	Bladder neck resection	
Urethral stenosis	4	IIIb	Internal urethrotomy, Urethroplasty	
Pulmonary embolism	1	IVa	ICU admission	

The complication of Hemorrhage requiring blood transfusion was managed by blood transfusion. Urethral stenosis was managed by Internal urethrotomy, Urethroplasty.

Discussion

Benign prostatic hyperplasia (BPH) is the most common cause of lower urinary tract symptoms (LUTS) in male patients older than 50. [17] Among the patients with BPH, approximately 30% necessitate surgical interventions due either to BPH-related complications or its impact on the patient's quality of life. [18] The European Association of Urology (EAU) guidelines recommend open simple prostatectomy (OSP) as a surgical treatment option in patients suffering from LUTS who has a prostate volume of higher than 80 ml. [19] Open simple prostatectomy has gained popularity since it gives the surgeon the chance to remove a considerable amount of adenomatous tissue with favorable post-surgical outcomes in both short and long terms. [20,21]

In the present study, 32% were in ASA I and 20% had hypertension. Among these patients, 50 were in Group 1 (i.e., aged between 50 and 65), 100 in

Group 2 (i.e., aged between 65 and 80), and 50 in Group 3 (i.e., age≥80). Some of these minimally invasive procedures including Holmium laser enucleation and thulium laser enucleation are considered current methods that can be performed in patients with high prostate volumes. [22] In a review study comparing transurethral laser prostatectomy procedures compared to OSP, those who underwent laser prostatectomy showed less hemoglobin reduction, shorter catheterization time, shorter hospital stay and less blood transfusion rate. [23] Some studies reported that blood transfusion rates were observed more frequently in octogenarians, probably because the frequency of use of anticoagulants is higher than in other age groups. [24] One of the advantages of laser technologies over other prostatectomy techniques is that surgery can be performed without the necessity of interruption of blood thinning agents. [25]

The rate of hypertension was significantly higher in Group 2 and Group 3 (i.e., octogenarians) than compared to Group 1. Although there was no difference between the groups regarding preoperative serum PSA levels, the rate of prostate biopsy rate was significantly higher in Group 1 and Group 2 than in compared to octogenarians. On the other hand, preoperative persistent AUR frequencies were significantly higher in octogenarians compared to others. Mean preoperative Qmax values were 5.57 ± 1.51, 6.84 ± 3.93 and 5.95 ± 2.04 ml/s in Group 1, Group 2 and Group 3, respectively. The mean PVR values were calculated as 136 ± 34, 137 ± 34, and 156 ± 29 in Group 1, Group 2, and Group 3, while the mean IPSS scores were 21.8 ± 4.37 in Group 1, 21.0 ± 6.41 in Group 2, and 22.5 ± 4.43 in Group 3. The complication of Hemorrhage requiring blood transfusion was managed by blood transfusion. Urethral stenosis was managed by Internal urethrotomy, Urethroplasty. There was no difference was observed between the three methods in terms of improvement in long-term functional results. [26,27] Considering all these, OSP is still commonly performed worldwide. In cases with PV>80 ml with large bladder stones or urethral stenosis, OSP may offer excellent postoperative results in suitable patient groups. [28]

The three groups were similar regarding blood transfusion rate, Clavien-Dindo Class 3 or higher complication rate and the overall complication rate. This latter finding is not consistent with the literature. [26] This finding can be attributed to the exclusion of patients using anticoagulant and antiaggregant therapy in our study, and to the fact that more patients in the octogenarian group in the related study. Our comparative analysis revealed that the mean duration of catheterization was significantly higher in older patients than younger patients. Since we usually remove the urethral catheters on the day of discharge, this approach might have led to a relatively longer length of hospital stay in these patients. Also, a relatively longer postoperative recovery period and a higher general complication rate in octogenarians might have contributed to more extended hospital stays. It should also be considered that studies investigating the length of hospital stay in patients undergoing transurethral resection of the prostate (TURP) or radical prostatectomy revealed that advanced patient age was significantly associated with prolonged hospital stay. [29]

Conclusion

The present study concluded that OSP is a safe procedure, and its effectiveness is limited compared to the other groups in terms of urethral catheter duration, length of hospital stay and IPSS scores. Before OSP However, perioperative management should be individualized for each patient.

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